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HEWLETT-PACKARD COMPANY
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EXAMINER

PARK, CHAN S

ART UNIT PAPER NUMBER

2622

DATE MAILED: 07/15/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/767,613

Applicant(s)

JOHNSON, DAVID A.

Examiner

CHAN S PARK

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Information Disclosure Statement

An initialed and dated copy of Applicant's IDS form 1449, Paper No. 2, is attached to the instant Office action.

Claim Objections

Claim 9 is objected to because of the following informalities: perhaps "of-media" should be "off-media" on line 9. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 5, and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Furuya U.S. Patent No. 6,297,873.

1. With respect to claim 1, Furuya teaches a method for calibrating a printing device, comprising the following steps:

a. performing an on-media calibration (actual calibration), including the following substeps:

- i. placing colorant on print media (col. 9, lines 24-25),
 - ii. performing a measurement to obtain on-media calibration measured values (col. 9, lines 48-50), and
 - iii. using the on-media calibration measured values to calibrate the printing device (col. 9, lines 50-51);
- b. performing an off-media calibration (estimated calibration in col. 9, lines 52-55) to obtain off-media calibration measured values, the off-media calibration being performed without placing colorant on print media (col. 11, lines 24-25);
- c. making a correlation (ΔE_a in col. 14, lines 45-47) between the on-media calibration measured values and the off-media calibration measured values (calibration history including both actual and estimated calibrations in col. 10, lines 8-24); and,
- d. performing subsequent off-media calibration in which the off-media calibration measured values are used along with the correlation between the on-media calibration measured values and the off-media calibration measured values to calibrate the printing device (β' in col. 14, lines 52-56).

Since the calibration history includes both actual and estimated calibrations, the Office interprets the last calibration as the actual, on-media calibration and the calibration before the last one as the off-media calibration. Read col. 13, lines 54-59.

2. With respect to claim 4, Furuya teaches the method as in claim 1, wherein in substep ii the measurement is performed using one of the following: a densitometer (col. 9, lines 48-50), a colorimeter, and a spectrophotometer. Since the density of the

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print of the calibration test pattern is measured, the Office interprets a device that measures the density of the print of the test pattern is the densitometer.

3. With respect to claim 5, Furuya teaches the method of claim 1, wherein substep iii is performed by varying print parameters of the printing device until the on-media calibration measured values are substantially equal to target measure values (col. 10, lines 25-40). It is apparent that by varying/adjusting the print parameters based on the correction value for calibration, the on-media calibration is correctly performed.

4. With respect to claim 17, Furuya discloses a printing device, comprising:
a colorant placing engine for in the course of normal printing placing colorant on print media, the colorant placing engine also for placing colorant on the print media during on-media calibration (actual calibration and col. 9, lines 24-25); and,

a sensing device, wherein during on-media calibration, the sensing device performs a measurement to obtain on-media calibration measured values (col. 9, lines 48-50);

wherein the printing device uses the on-media calibration measured values to calibrate the printing device (col. 9, lines 50-51);

wherein the printing device makes a correlation (ΔE_a in col. 14, lines 45-47) between the on-media calibration measured values and off-media calibration measured values calculated during an initial off-media calibration cycle (calibration history including both actual and estimated calibrations in col. 10, lines 8-24); and,

wherein, during subsequent off-media calibration cycles the printing device uses the off-media calibration measured values along with the correlation between the on-media calibration measured values and the off-media calibration measured values to calibrate the printing device (β' in col. 14, lines 52-56).

Since the calibration history includes both actual and estimated calibrations, the Office interprets the last calibration as the actual, on-media calibration and the calibration before the last one as the off-media calibration. Read col. 13, lines 54-59.

5. With respect to claim 18, Furuya discloses a printing device as in claim 17, wherein the sensor comprises one of the following: a densitometer (col. 9, lines 48-50), a colorimeter, and a spectrophotometer. Since the density of the print of the calibration test pattern is measured, the Office interprets a device that measures the density of the print of the test pattern is the densitometer.

6. With respect to claim 19, Furuya discloses a printing device as in claim 17, wherein during on-media calibration, the printing device varies print parameters until the on-media calibration measured values are substantially equal to target measure values (col. 10, lines 25-40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya as applied to claim 1 above, and further in view of Applicant's Admitted Prior Art in the Background of the specification pages 1-2 (hereinafter Admitted Prior Art).

7. With respect to claim 2, Furuya teaches the method of claim 1 but it does not teach expressly that the colorant is toner.

Admitted Prior Art teaches a method of calibrating a printer that uses toner (page 1, lines 10-13).

Furuya and Admitted Prior Art are analogous art because they are from the same field of endeavor that is the printer calibrating art.

Since it is well known to use toner in a laser printer and Admitted Prior art teaches that it is well known to use toner in a printer, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use toner of Admitted Prior Art in the printer of Furuya.

The suggestion/motivation for doing so would have been to calibrate the printer that uses toner.

Therefore, it would have been obvious to combine Furuya and Admitted Prior Art to obtain the invention as specified in claim 2.

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8. With respect to claim 6, Furuya teaches the method as in claim 1 but it does not teach expressly that the off-media calibration step includes the following steps:

- e. placing colorant on a transportation belt of the printing device; and,
- f. performing a measurement of the colorant on the transportation belt to obtain the off-media calibration measured values.

Admitted Prior Art teaches an off-media calibration method wherein the off-media calibration step includes, a) placing colorant on a transportation belt of the printing device (page 1, lines 23-26) and b) performing a measurement of the colorant on the transportation belt to obtain the off-media calibration measured values (lines 26-28).

Furuya and Admitted Prior Art are analogous art because they are from the same field of endeavor that is the printer calibrating art.

Since both, Furuya and Admitted Prior Art, have the advantage of saving consumable media during the calibration, at the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the calibration history data including the actual calibration data of Furuya into the off-media calibration method of Admitted Prior Art.

The suggestion/motivation for doing so would have been to solve the inaccuracy problem of off-media calibration by implementing both actual and estimated calibration methods introduced by Furuya (col. 15, lines 39-57).

Therefore, it would have been obvious to combine Furuya with Admitted Prior Art to obtain the invention as specified in claim 6.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya as applied to claim 1 above, and further in view of Wang et al. U.S. Patent No. 6,435,654 (hereinafter Wang).

9. With respect to claim 3, Furuya teaches the method as in claim 1, but it does not expressly teach that the colorant is ink.

Wang teaches a method for performing an on-media calibration a printing device, comprising the steps of:

placing colorant on print media (col. 5, lines 3-5),
performing a measurement to obtain on-media calibration measured values, and
using the on-media calibration measured values to calibrate the printing device
(col. 5, lines 1-48), wherein the colorant is ink (col. 1, lines 8-13 & col. 5, lines 3-5).

Furuya and Wang are analogous art because they are from the same field of endeavor that is the printer calibration art.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement the on/off calibration method of Furuya into the calibration of ink-jet printer of Wang.

The suggestion/motivation for doing so would have been to save the print medium during the calibration of the ink-jet printer.

Therefore, it would have been obvious to combine Furuya and Wang to obtain the invention as specified in claim 3.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya as applied to claim 1 above, and further in view of Knox et al. U.S. Patent No. 5,649,073 (hereinafter Knox).

10. With respect to claim 7, Furuya teaches the method as in claim 1, but it does not teach expressly that the colorant is placed on the print media in half-toned patches.

Knox teaches an on-media calibration method wherein the colorant is placed on the print media in half-toned patches (col. 5, lines 33-52 & col. 7, line 3).

Furuya and Knox are analogous art because they are from the same field of endeavor that is the printer calibrating art.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the half-toned patches of Knox into the on-media calibration method of Furuya.

The suggestion/motivation for doing so would have been obvious to use the reflectance of patches to measure the toner amount and thus providing the calibration data based on the toner amount.

Therefore, it would have been obvious to combine Furuya and Knox to obtain the invention as specified in claim 7.

11. With respect to claim 20, arguments analogous to those presented for claim 7, are applicable.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya and Knox as applied to claim 7 above, and further in view of Admitted Prior Art.

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12. With respect to claim 8, Furuya teaches the method as in claim 1 and Knox further teaches that the placed colorant being arranged in half-toned patches (col. 5, lines 33-49).

Furuya and Knox do not teach expressly a method of placing colorant on a transportation belt of the printing device, wherein the placed colorant being arranged in half-toned patches that correspond to the half-toned patches placed in on media calibration.

Admitted Prior Art teaches an off-media calibration method wherein the off-media calibration step includes, a) placing colorant on a transportation belt of the printing device (page 1, lines 23-26) and b) performing a measurement of the colorant on the transportation belt to obtain the off-media calibration measured values (lines 26-28).

Furuya, Knox and Admitted Prior Art are analogous art because they are from the same field of endeavor that is the printer calibrating art.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the on/off calibration methods on half-toned patches of Furuya and Knox as applied in claim 7 into the method of placing colorant on a transportation belt of the printing device and measuring the calibration values taught by Admitted Prior Art.

The suggestion/motivation for such an implementation would have been to improve the inaccuracy problem caused by off-media calibration.

Furthermore, it would have been obvious to one of ordinary skill in the art to arrange the colorant placed on the transportation belt in half-toned patches that

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correspond to the half-toned patches placed on the print media during on-media calibration.

The suggestion/motivation for doing so would have been to obtain a set of correction value from the same nature. If actual correction value for calibration is obtained from the the method using half-toned patches and the estimated correction value of calibration is obtained from different calibration method, it would have been impossible to make a correlation between the two.

Therefore, it would have been obvious to combine all three references to obtain the invention as specified in claim 8.

Claims 9, 10, 12, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya in view of Admitted Prior Art.

13. With respect to claim 9, Furuya discloses a self-calibrating printing device (printer 18), comprising:

- a printer transportation belt for transporting print media (fig. 1);

- a marking engine for in the course of normal printing placing colorant on print media, the marking engine also for placing colorant on the print media during on-media calibration (col. 9, lines 24-25); and,

- a sensing device, wherein during on-media calibration, the sensing device performs a measurement to obtain on-media calibration measured values, and wherein during off-media calibration (col. 9, lines 48-51), the sensing device performs a

measurement to obtain off-media calibration measured values (estimated calibration in col. 9, lines 52-55 & col. 11, lines 24-25);

wherein the self-calibrating printing device uses the on-media calibration measured values to calibrate the printing device (actual calibration in col. 9, lines 50-51);

wherein the self-calibrating printing device makes a correlation (ΔE_a in col. 14, lines 45-47) between the on-media calibration measured values and the off-media calibration measured values (calibration history including both actual and estimated calibrations in col. 10, lines 8-24); and

wherein, during subsequent off-media calibrations the self-calibrating printing device uses the off-media calibration measured values along with the correlation between the on-media calibration measured values and the off-media calibration measured values to calibrate the printing device (β' in col. 14, lines 52-56).

Since the calibration history includes both actual and estimated calibrations, the Office interprets the last calibration as the actual, on-media calibration and the calibration before the last one as the off-media calibration. Read col. 13, lines 54-59.

Furuya does not disclose expressly that the marking engine places colorant on the printer transportation belt during off-media calibration.

As noted above in claim 6, Admitted Prior Art teaches an off-media calibration method wherein the off-media calibration step includes, a) placing colorant on a transportation belt of the printing device (page 1, lines 23-26) and b) performing a

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measurement of the colorant on the transportation belt to obtain the off-media calibration measured values (lines 26-28).

Furuya and Admitted Prior Art are analogous art because they are from the same field of endeavor that is the printer calibrating art.

Since both, Furuya and Admitted Prior Art, have the advantage of saving consumable media during the calibration, at the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the calibration history data including the actual calibration data of Furuya into the off-media calibration method of Admitted Prior Art.

The suggestion/motivation for doing so would have been to solve the inaccuracy problem of off-media calibration by implementing both actual and estimated calibration methods introduced by Furuya (col. 15, lines 39-57).

Therefore, it would have been obvious to combine Furuya with Admitted Prior Art to obtain the invention as specified in claim 9.

14. With respect to claim 10, arguments analogous to those presented for claim 2, are applicable.

15. With respect to claim 12, arguments analogous to those presented for claim 4, are applicable.

16. With respect to claim 13, arguments analogous to those presented for claim 5, are applicable.

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17. With respect to claim 16, Furuya discloses that the sensing device comprises a plurality of sensors (identification sensors 67, 68, and temperature sensor 82 in col. 12, lines 9-28).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Furuya and Admitted prior art as applied to claim 9 above, and further in view of Wang.

18. With respect to claim 11, arguments analogous to those presented for claim 3, are applicable.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Furuya and Admitted Prior Art as applied to claim 9 above, and further in view of Knox.

19. With respect to claim 14, the combination of Furuya and Admitted Prior Art discloses the self-calibrating printing device as in claim 9, but it does not disclose expressly that the marking engine places colorant on the print media in half-toned patches.

Knox discloses that a marking engine places colorant on the print media in half-toned patches (col. 5, lines 33-52 & col. 7, line 3).

Furuya and Knox are analogous art because they are from the same field of endeavor that is the printer calibrating art.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the half-toned patches of Knox into the on-media calibration method of Furuya.

The suggestion/motivation for doing so would have been obvious to use the reflectance of patches to measure the toner amount and thus providing the calibration data based on the toner amount.

Therefore, it would have been obvious to combine Furuya and Knox to obtain the invention as specified in claim 14.

20. With respect to claim 15, the combination of Furuya and Admitted Prior Art discloses the self-calibrating printing device as in claim 9, but it does not disclose expressly that during off-media calibration, the colorant placed on the transportation belt is arranged in half-toned patches that correspond to the half-toned patches placed on the print media during on-media calibration.

Knox discloses that a marking engine places colorant on the print media in half-toned patches (col. 5, lines 33-52 & col. 7, line 3).

Furuya, Knox and Admitted Prior Art are analogous art because they are from the same field of endeavor that is the printer calibrating art.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the on/off calibration methods on half-toned patches of Furuya and Knox into the method of placing colorant on a transportation belt of the printing device and measuring the calibration values taught by Admitted Prior Art.

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The suggestion/motivation for such an implementation would have been to improve the inaccuracy problem caused by off-media calibration.

Furthermore, it would have been obvious to one of ordinary skill in the art to arrange the colorant placed on the transportation belt in half-toned patches that correspond to the half-toned patches placed on the print media during on-media calibration.

The suggestion/motivation for doing so would have been to obtain a set of correction value from the same nature. If actual correction value for calibration is obtained from the method using half-toned patches and the estimated correction value of calibration is obtained from different calibration method, it would have been impossible to make a correlation between the two.

Therefore, it would have been obvious to combine all three references to obtain the invention as specified in claim 15.

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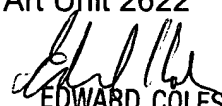
Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAN S PARK whose telephone number is (703) 305-2448. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on (703) 305-4712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

csp
July 8, 2004

Chan S. Park
Examiner
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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER